

DEQ Mercury Benefit-Cost Study: An update

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Virginia Mercury Symposium

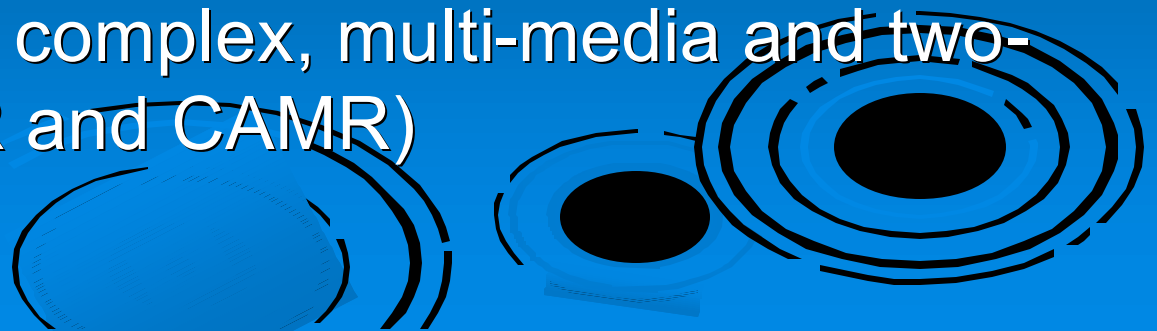


Virginia GAB request to DEQ

➤ H 1055/ SB 651 –

- evaluate state of existing mercury control technologies
- technical and economic feasibility of additional controls
- Assessment of mercury reductions and related benefits

➤ GAB request – complex, multi-media and two-pronged (CAIR and CAMR)



Purpose & approach

- Symposium -
- Key purpose of study – assess costs versus benefits (damages) of existing mercury control technologies – coal fired power plants only
- Intensive research on approach to adopt
- Many states adopted unique approaches (in-house, external, broad stroke analysis)
- This study is – collaborative and rigorous – comparing typical calculations with dynamic modeled scenarios (firm specific)

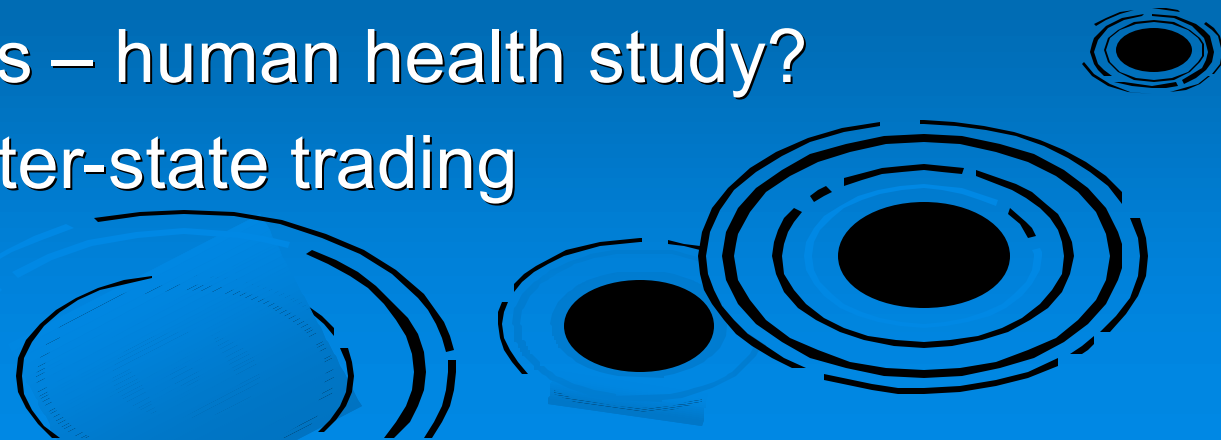


Stepping back – other states

- MN, WV, NJ, IL, PA, LA and others... - conducted cost-benefit studies
- NC, GA, TX and many others...gearing up
- DEQ study to include summary of select states efforts and related assessments
- Each state is unique in issues, regulatory response and approach/ data used – a typical dilemma
- Quick snapshot - IL, MN and WV

Other states - Illinois specific CAMR

- IL (ICF contracted w IPM custom-fitting): Hg reduction by 15% in 2015 – costs of production increase 2% in 1st year, then fall (learning by doing), revenue marginally affected.
- CAMR adoption – retail electricity prices and other expenses: + 1-3.5%, net increase in residential bill: \$0.75 -1.50
- Benefit analysis – human health study?
- Not allowing inter-state trading



Minnesota's net benefit study

➤ Scenarios used:

- 50% less -MN Hg emissions
- ***50% less- Midwest emissions (12.5% MN)***
- 50% less- US emissions
- 50% less- worldwide emissions

➤ WTP – Willingness to Pay approach – predictive human behavior modeling (mail and personal interviews): Use and non use value, caveats

➤ Procedure endorsed by – DOI, NOAA. (RFF!)

➤ 12.5% scenario – benefit analyses

Findings – MN, WVA

- Minnesotans willing to pay \$118 for baseline - 12.5% - reduction in Hg
- Averaging across state: \$ 0.12/person/day
- Key caveat: stated *often differs* from actual
- West Virginia – Brush stroke analysis (time)
- Costs higher for plants smaller than 400MW
- EPA cross-over: 500MW. Capital costs change around the cross-over.

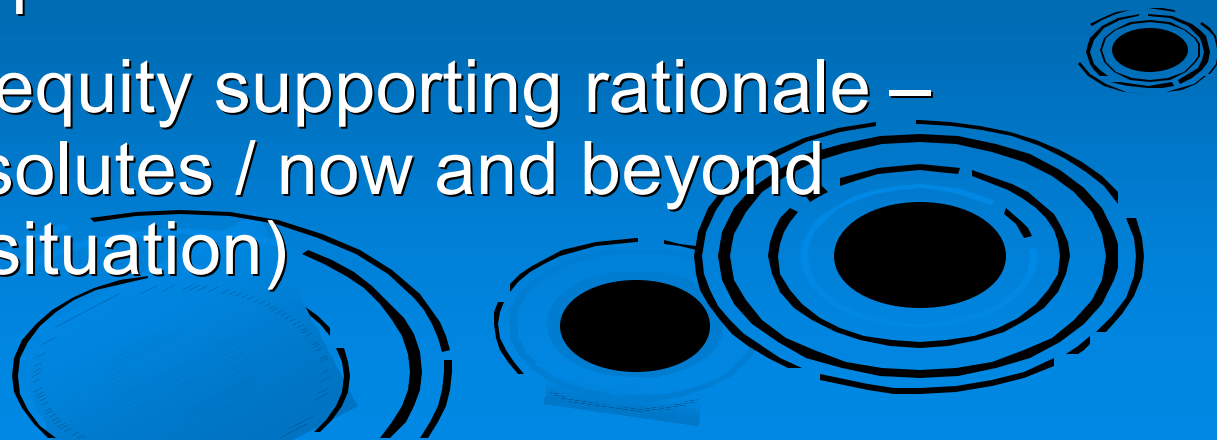
West VA findings: FDG + SCR

- Capital costs per EPA model runs: \$493 / kw (150 MW plant)
- Capital costs EPRI IEC Cost runs: \$576 / kw
- O/M costs similar in trend
- Adopting federal cap-trade rule
- Source: Kenna Amos – WVA DAQ



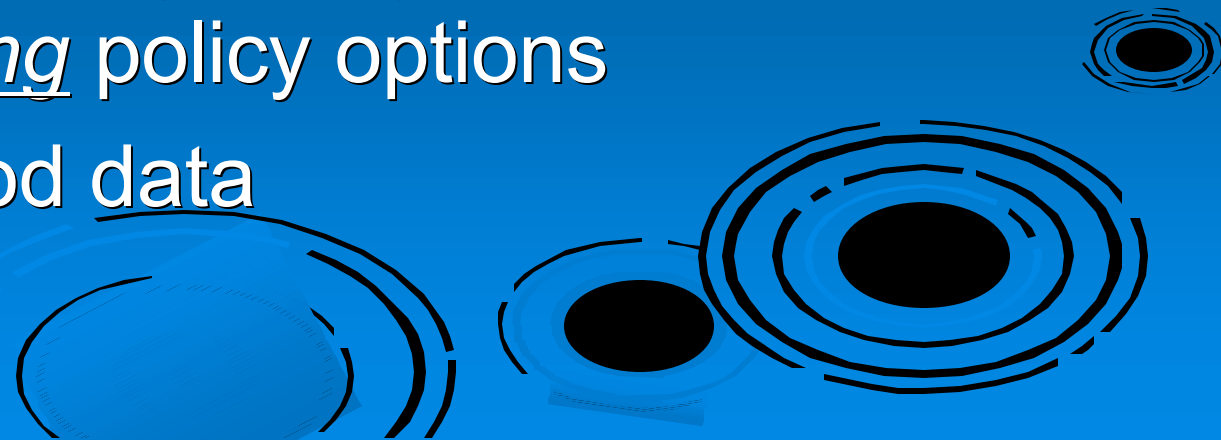
Challenges to keep in mind

- Data – relevancy, accuracy and validation
- Using Virginia specific coals analyses
- Two pronged question – balancing co-benefits
- Two differing perspectives:
 - Positive – Cannot ignore co-benefits, balance at the margin
 - Normative / equity supporting rationale – focus on absolutes / now and beyond (regulator's situation)



Benefit – Cost analysis

- Standard approach used since Reagan administration (regulatory efficiency)
- Over time – commonly used approach, also sometimes misused
- More appropriate a tool for: anthropogenic effects, assessing policy scenarios, or best, informing policy options
- Requires good data



DEQ approach

- Net benefits versus costs –
 1. Baseline - CAIR
 2. If CAMR adds onto CAIR (additional CAMR specific controls)
 3. Try to net out additional CAMR specific investments – evaluate its impact (marginal costs of CAMR)
- Cost-effectiveness: assess net present value costs over a 30 yr timeline
- Benefit assessment – Human Health Risk Assessment – VCU study
- Quantify and monetize actual versus potential levels of risk: benefits analysis complete.

Study – Work in progress

- Unbiased and realistic (co-benefits +/-)
- Evaluating use of IECM and CueCost
- Evaluating all studies possibly done
- Working to ensure – firm specific contextual data, pro-bono inputs from NCSU – Chris Frey, VT and also tapping into existing DEQ resources and data
- Expected completion – Late Summer 08